



**Federal Democratic Republic of Ethiopia**  
**Ministry of Health**

***Vaccination Service Extension package***

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## **Introduction**

The health extension package programme that the Ethiopian Government adopted makes 85 percent of the Ethiopian population which lives in the rural areas as center of health problems development. This is because of the fact that the majority of the health problems which occur due to communicable diseases affect the rural population. Currently, the diseases that are the causes of maternal and child morbidity, mortality and disability and which can be prevented by vaccination take 1/3 of the share of the health problem. Since the importance of vaccination in protecting children and mothers from diseases, death and disability is very high, the necessary accord has been given to it at the global and national levels. Vaccination is also known as one of the most effective strategies for the control of communicable diseases.

Hence, it is possible to quickly increase accessibility and coverage of vaccination services by implementing an integrated health extension package that focuses on disease prevention and behavioral change.

Diseases that can be controlled through vaccination are tuberculosis, measles, diphtheria, whooping cough, polio, and tetanus. These are diseases that cause a huge problem on the health of children and mothers. The 1994 Health and Health Related Indicators report produced by the Ministry of Health, shows that vaccination coverage for TB is 58.6%, DPT 58.3% and for measles 52.6%. Nevertheless, since mothers and children, who are beneficiaries of the vaccination service did not take full advantage of the service, it has not been possible to gradually and at the required level, reduce and control the diseases which can be prevented by vaccination.

Since vaccination coverages are especially very much lower than the above among the agricultural and pastoralist population, children and mothers in these

areas are very much exposed to health problems caused by vaccine preventable diseases. By avoiding the empty traditional saying of " children will grow by their chances", the growth and development of children born must be ensured by timely and full vaccination. On the other hand, since the health policy gives priority to disease prevention and vaccination service as an effective strategy of preventing diseases, taking vaccination service as one health package in the health extension package, is highly advantageous. The extended immunization programme which is currently under implementation is a service designed for children under one year of age and for women of 15 - 49 years. Vaccination service can be also taken as a human right and a pragmatic action to poverty reduction.

Therefore, vaccinating children and mother is the only solution to protect them from diseases, death and disability. Ensuring the vaccination of children is the obligation of parents and communities. In order to strengthen and improve the coverage of the vaccination service in Ethiopia, implementing a family centered vaccination service extension package is a direction that has no alternative. The foundation and starting point of the health extension package is the farmer and the rural family. It is more a family centered programme designed towards the realization of vaccination service at the family level. It is expected that the necessary conditions will be fulfilled to the broader and in-depth implementation of the package.

## **2. Objective**

- To make children healthy and competent citizens and to provide adequate health care to women of child-bearing age,

### **Specific Objectives**

- 2.1. Provide full information and education to the society about vaccination.

- 2.2. Strengthen the knowledge and attitude of the society about the vaccination programme and enable it to fully participate in all actions related to the programme.
- 2.3. Reduce and control the illness, death and disability among children and women, caused by vaccine preventable diseases.
- 2.4. Contribute to the success of polio eradication.
- 2.5. Reduce the health service delivery cost through vaccination and other child health services.
- 2.6. Remove the unnecessary expense and time spent for child health services through the vaccination of children.

### **3. Implementation strategy**

#### **3.1. Data collection**

Baseline data will be first collected by the health extension workers. The data will help to evaluate the outcome and progress of the vaccination package from its start up to where it stands.

##### **Priority data**

- Children and mother within vaccination age and their vaccination status.
  - Vaccination coverage to be prepared with surrounding health facilities and the Woreda Health Office.
  - Data on vaccine preventable diseases.
  - Population that is covered and not covered by vaccination service.
- 3.2. Sensitizing and educating the society to know the diseases that make children and women ill, die and disabled.
  - 3.3. Identifying people that are heard by the society and enlisting their support and participation for the vaccination service package activities.

- 3.4. Providing adequate information around schools, religious places and public meetings on EPI and make them to participate in EPI implementation.
- 3.5. Conducting house -to house visits to identify, register and persuade drop out children and mothers to continue their vaccination and to find out solutions for the problems identified during the house-to-house visits.
- 3.6. Conducting training of trainers and increase the number of partners.
- 3.7. Conducting sensitization and education activities to enable the public benefit from national immunization days.
- 3.8. Enlisting the participation of communities and other relevant institutions in the preparation of the vaccination service extension package.
- 3.9. Sensitizing concerned government and non-government organization and strengthen their collaboration on the implementation of the vaccination service package.
- 3.10. Mobilizing health workers in the neighborhoods to provide professional and material assistance.
- 3.11. Giving encouragement and incentives to those who performed a meritorious work in the implementation of health extension package.
- 3.12. Strengthening the vaccination extension package by mobilizing and effectively using local resources ( labor, knowledge and material).
- 3.13. Encouraging the development and use of local rules and regulations that can strengthen the implementation of the vaccination service package; monitor the implementation of those rules and regulations.
- 3.14. Conducting the necessary monitoring and evaluation activities in relation to the vaccination service package.
- 3.15. Undertaking experience sharing activities (Kebele to kebele).

**4. Activities that would be undertaken by the vaccination service extension worker.**

- 4.1. Concerning vaccination service.
  - 4.1.1. Collect and appropriately document information related to vaccination and use them as necessary.
  - 4.1.2. Give vaccination service package related health education at appropriate places and times to families living in the kebele, all residents of the kebele, government and non-government organization, and others.
  - 4.1.3. Make an effort to the preparation of a detailed vaccination service package plan with the participation of communities and other concerned groups and ensure that ownership and support is given by residents of the kebele and other organizations during the implementation of the plan.
  - 4.1.4. Give training that helps to strengthen the vaccination service package.
  - 4.1.5. Ensure that vaccines, materials and budget required for the vaccination service package are received on time and in adequate quantity (they can be received from higher or local offices).
  - 4.1.6. Ensure that regular vaccination is given to mothers and children on the basis of the plan and the national guidelines. Prepare the necessary materials to ensure that vaccination campaigns are successfully undertaken and house to house visits are made to identify dropouts. Make consistent follow up on the drop outs and educate them to be vaccinated.
  - 4.1.7. Prepare and submit to the woreda health office and to others monthly, quarterly and annual reports related the regular vaccination service package and the campaigns undertaken.

- 4.1.8. Document all information related to the implementation of the kebele vaccination service extension and share these information with concerned offices so that a review is done and appropriate actions are taken to overcome problems encountered during implementation.
- 4.1.9. When measles occur in the kebele, study the problem and take actions for children to be taken to the nearby health facility. Inform the community and take appropriate action to raise measles coverage.
- 4.1.10. Strengthen collaboration with all stakeholders around the area for better performance and for putting the package on a solid ground.
- 4.1.11. Encourage the development and use of local rules and regulations through the participation of beneficiary families, communities and others.
- 4.1.12. Vaccinations are prepared to protect children from illness, death and disability. Hence, a follow up should be made to find if there are children who have been exposed to illness and death. Study the problem and find solution in collaboration with the woreda health office. Provide full information to affected families and the community. Assess the causes of the problem and take the necessary precaution so that such a problem does not occur.

## **4.2. Detailed vaccination service extension activities that would be undertaken.**

### **4.2.1. Baseline survey**

The primary task of the health extension workers should be to collect relevant information that would be useful for strengthening the implementation of the vaccination package and monitor the progress made.



**Information that the health extension workers need to collect and have for the vaccination service package.**

- ◆ A map that shows the boundary of the kebele. This map is expected to indicate the villages, schools, churches, mosques, health institutions, rivers, mountains, roads etc. found in the kebele. This map can be prepared in consultation with agricultural extension workers, surrounding schools, kebele administration and woreda health office.
- ◆ Organizations that can provide assistance and the type of assistance they can give.
- ◆ The population living in the kebele by age and sex.
- ◆ The population that has been vaccinated and not vaccinated.
- ◆ Eligible children and mothers ( by their age), children below the age of one year and women of childbearing age (15-49) by age and their vaccination status.
- ◆ Vaccination coverage of the kebele in consultation with the woreda health office or surrounding health Institutions.
- ◆ Information related to vaccine preventable diseases in the kebele.
- ◆ Information on cultural and traditional attitudes, problems encountered as related to vaccination to be used when necessary.

4.2.2. Provide the necessary education on vaccination service extension activities to the kebele population, government and non-government organization.

- ◆ The health extension workers have to give consistent education to the kebele people, government and non-government organizations so that they have adequate understanding on the vaccination service extension package. Participate and assist the implementation of the package and collaborative work is strengthened on the process.

4.2.3. Develop the necessary vaccination service extension plan and act for its implementation. The health extension workers will prepare a detailed vaccination service plan and submit to the woreda health office for approval. This plan should be known by beneficiary communities and concerned organizations to ensure that the communities and organizations have a feeling of ownership and that it is implemented through their active participation. This process will also strengthen future joint planning, implementation, monitoring and collaboration.

4.2.4. Ensure that vaccines and different materials which are required for vaccination service are met. The following are required by the health extension workers to provide adequate and full vaccination service to eligible children and mothers of the kebele.

4.2.4.1. Operational budget for vaccination activities in the kebele.

4.2.4.2. Vaccines

- ◆ Polio as necessary
- ◆ Measles with diluent
- ◆ BCG with diluent
- ◆ DPT as necessary.
- ◆ TT as necessary.

4.2.4.3. Vaccine containers and transporting materials.

- ◆ Small vaccine carriers which can be taken by hand or carried on the shoulder (if possible 2 if not 1).
- ◆ Plastic ice bags, ice water/cold containers (ice packs) 8-12 .
- ◆ Thermometer ( if possible 2, if not 1 ).
- ◆ Different syringes for vaccination and diluting vaccines.
  - BCG vaccine diluting syringe 2 cc with needles /disposable).
  - Syringes 0.05/0.1 cc AD with needles as necessary for BCG vaccination.

- Syringes 5cc with needles for diluting measles vaccine (disposable) as necessary.
- Syringes 0.5cc AD with needles for DPT and TT vaccination (as necessary).
- Carton boxes (safety boxes) for disposing used syringes and needles (as necessary).
- ◆ Bags for containing vaccines (if possible 2 it not 1).
- ◆ Registration book (as necessary)
- ◆ Mothers and child cards (as necessary)
- ◆ Tetanus vaccination card (as necessary)
- ◆ Daily vaccination tally sheet (as necessary)
- ◆ Vaccines registration /control form (as necessary)
- ◆ Monthly vaccination reporting form (as necessary)
- ◆ File folders (as necessary)
- ◆ File boxes (as necessary)
- ◆ Graph papers for monitoring vaccination (as necessary).
- ◆ Different types of markers (as necessary)
- ◆ IEC materials, flip charts and posters (as necessary)
- ◆ Cotton
- ◆ Water, soap and towel for hand washing and drying.
- ◆ Transport based on the local condition
  - Pack animals (horse, mule)
  - Bicycle.

#### **4.2.5. Training that can strengthen the kebele vaccination service extension package.**

The health extension health workers will be training known, heard and committed people (youth and elders) that can assist them in sensitizing and mobilizing the kebele people, in registration, follow up of drop out mothers and children and in identifying problems related to the vaccination service extension.

#### **4.2.6. Vaccinate children and mothers**

The health extension workers, after giving the necessary education to the kebele people and having completed the necessary preparation, will vaccinate the children and mothers in the kebele at static and outreach sites. They will carefully register and document the activities they have undertaken.

By working jointly with the kebele people and other concerned sectors, the health extension workers will ensure the successful implementation of the national polio and measles vaccination campaign, based on the national guidelines.

#### **4.2.7. Submit reports on regular vaccination activities**

The health extension workers will carefully prepare and submit to the woreda health office the implementation of activities undertaken on a regular basis and through national campaigns, using the reporting forms developed for this purpose. In addition to this, and as necessary, they will submit reports to the kebele council.

#### **4.2.8. Encourage the development and implementation of local rules and regulation that reinforce the vaccination programme.**

The health extension workers in consultation with the inhabitants and families of the kebele, kebele council members, and other relevant organizations will make an effort to the development and implementation of local rules and regulations that will reinforce the vaccination programme. Example, rules and regulations on families that do not bring their children for vaccination on time, on dropouts, defaulters and refusals.

The main task of the health extension workers is to provide complete vaccination service to children and mothers. Hence, in order to develop the knowledge of these workers on vaccine preventable diseases, the necessary information on these diseases have to be

provided to them. The vaccine preventable diseases are the following.

#### 4.3. **Diseases that can be prevented/avoided by vaccines**

- ◆ Pulmonary tuberculosis.
- ◆ Poliomyelitis
- ◆ Whooping cough
- ◆ Diphtheria
- ◆ Measles and
- ◆ Tetanus.

Attention is given to these diseases because of the following reasons.

- ◆ The vaccines prepared to prevent these diseases are effective and cheap (cost-effective).
- ◆ Since 1/3 of the illnesses, disabilities and deaths among children are due to these diseases.

##### **4.3.1. Pulmonary Tuberculosis**

Pulmonary tuberculosis is a disease that can be easily transmitted from man to man and is caused by a microscopic bacteria called mycobacterium tuberculosis. The World Health Organization report shows that in 1995 GC, three million people have died due to tuberculosis.

Tuberculosis can also attack other parts of the body, (the bone, joints, brain etc) and can pose a serious health problem.

Although the disease attacks all age group population, it can do more harm to children. Pulmonary tuberculosis can very easily and widely be transmitted in places where there is crowding and deprivation, where the health service is weak, where there is high malnutrition and in places which are dark, full of dirt and crowded. These places are ideal for the tuberculosis bacteria to grow and multiply.

### **Mode of Transmission**

1. A person with tuberculosis can transmit the disease to another person next to him, during coughing and sneezing. The bacteria that comes out along with his breathing pollutes the air. When the healthy person inhales the polluted air and suspended bacteria, he can contract the disease.
2. By drinking the milk of cows affected by pulmonary tuberculosis.

### **Signs of the diseases**

- ◆ Cough for more than 3 weeks
- ◆ General body weakness
- ◆ Loss of body weight
- ◆ Fever
- ◆ Night sweating
- ◆ Chest pain (sharp)

### **Methods of prevention**

It is necessary for children to give BCG vaccination on time in order to prevent them from tuberculosis. Vaccinated children have a very low chance of having tuberculosis. Children not born in health facilities should be vaccinated at health facilities through sensitization and education of families by health extension workers.

#### 4.3.2. **Poliomyelitis (polio)**

Poliomyelitis is caused by the polio virus. It is a dangerous disease that leads to physical disability and death.

### **Mode of Transmission**

- ◆ Polio is transmitted when food and water that are contaminated by the polio virus are taken. Stool and urine are the main carriers of the virus. In general, the virus is transmitted from one person to another by touching food with unhygienic (dirty) hands, by not covering and exposing foods to flies and by drinking polluted or unboiled water.

### **Signs of the Disease**

- ◆ Fever
- ◆ Headache

- ◆ Vomiting
- ◆ Diarrhea
- ◆ Flacid and pain muscles
- ◆ Paralysis of lower or upper extremity (legs and hands)

#### **Methods of prevention**

- ◆ Since polio has an effective vaccine, it is possible to prevent the diseases by timely and adequately vaccinating children. In addition, it is necessary to wash the hands before eating food.
- ◆ Covering food to avoid contamination with flies, keeping clean residential houses and compounds, drinking boiled water, constructing and properly using toilet facilities can help to prevent polio.
- ◆ On the other hand, supporting the national effort to eradicate polio in Ethiopia by involving in AFP cases surveillance activities can contribute to the prevention of polio. Hence, health extension workers have the duty of sensitizing and ensuring the active participation of people in the kebeles for the campaign against polio.

#### **4.3.3. Whooping cough**

Whooping cough is caused by a microscopic germ called *Bordetella pertussis*. It is a disease that attacks the respiratory system. Whooping cough attacks children up to the age of four years, and can bring disastrous health problems on children under the age of one year. It affects children who are not vaccinated.

#### **Mode of Transmission**

The whooping cough is transmitted from a sick child to a healthy child through inhaling air that is polluted by the whooping cough bacteria. The organism that comes from the sick child during sneezing and coughing pollutes the air that a healthy child inhales.

### **Signs of the disease**

- ◆ Fever
- ◆ Cough (which gets worse- whooping)
- ◆ Vomiting

### **Methods of prevention**

- ◆ The most effective preventive method for whooping cough is vaccination. Therefore, getting children vaccinated against the disease on time and fully is the only alternative to prevent the disease.

#### **4.3.4. Diphtheria**

Diphtheria is a disease caused by the microscopic organism called coryne bacterium diphtherium.

Diphtheria is a dangerous disease that severely affects and kills children. This disease mostly affects the throat and causes breathing problems. It is a disease that mostly affects children who are not vaccinated. The secondary cause of diphtheria is mostly crowding and suffocation.

### **Modes of transmission**

The diphtheria bacteria is transmitted from a sick to a healthy child through the fluid that carries the bacteria and that comes out from the mouth and nose of a sick child inhaled by a healthy child.

### **Signs of the disease**

- ◆ Sore throat
- ◆ Loss of appetite
- ◆ Low grade fever
- ◆ Dirty grey membrane in the throat
- ◆ Swelling of the neck (in seriously ill children)



### **Prevention Methods**

Diphtheria can only be prevented by vaccination.

#### **4.3.5. Tetanus**

Tetanus is caused by the microscopic bacteria clostridium tetani. These bacteria grow and multiply in gangrenous parts of the body such as the umbilical cord. Tetanus is a dangerous disease that affects both children and adults. Nevertheless, new born babies are mostly and severely affected. Tetanus bacteria produce poisonous materials that affect the nerves that control the muscles.

The World Health organization report indicates that tetanus kills 500,000 - 1000,000 infants every year. Therefore, most children who are infected with tetanus in their first week of life are prone to die due to this disease.

In Ethiopia over 17,900 children are affected by tetanus every year, out of which, 13,400 of them die. Statistics also show that about 2000 mothers also die due to tetanus. Tetanus, especially (Neonatal tetanus), which affects new born babies is more prevalent in rural areas than in urban areas where there is much cow dung. The tetanus bacteria can be found in zoos where there is dry cow dung and the surrounding soil, hand digging tools, under the hand, fingers and foot toes, rusted bins and metals. A child with tetanus should be taken immediately by his family to a health facility.

### **Modes of Transmission**

Tetanus is not a disease that is directly transmitted from a sick person to a healthy person. But, people/ children and adults, get the disease when an injured part of their skin comes in contact with soil or cow dung which harbor the tetanus bacteria and when the

bacteria penetrates deep into the body. On the other hand, tetanus can be contracted by a healthy person when his/her skin is cut by rusted, and unhygienic sharp materials such as razor blades, scissors, nails knives etc.

#### **Signs of the disease**

- ◆ Stiffness of the muscles of the jaw/lock jaw
- ◆ Stiffness of the neck
- ◆ Difficulty with swallowing
- ◆ Fever and sweating
- ◆ Inability to suck breast especially for new born babies.

#### **Methods of prevention**

- ◆ Tetanus can mainly be prevented by vaccination. In order to prevent tetanus, mothers and children in the vaccination age groups have to be vaccinated on time. In addition to this, prevention can be undertaken when women have to be carefully handled and assisted during delivery by health extension workers, health professionals and trained traditional birth attendants. Such careful delivery service will help to prevent the disease. On the other hand, intensive education given to the public against harmful traditional practices such as cutting the umbilical cord of new borns with unhygienic materials, covering the umbilicus with wet or dry cow dung etc contribute much to the prevention of tetanus.

#### **4.3.6. Measles**

Measles is caused by microscopic viruses. This disease is a very dangerous childhood disease. It is the most child killing diseases among the vaccine preventable diseases. Measles is very common where there is poverty, crowding and less number of vaccinated children. A World Health Organization report shows that over 1.0 million children died of measles in 1995. Over 30.0 million children are known to be ill due to measles.

Measles can very easily spread and severely affect many children in a very short time. Children who are physically weak and malnourished are most affected by this disease.

### **Modes of Transmission**

The transmission of measles from a sick child to a healthy child is through air. It is when a child having measles coughs and sneezes and when millions of the measles virus are spread to the surrounding area and pollute the air. A healthy child who is found near to the sick child gets the disease when he inhales the air that has been polluted by the measles virus.

### **Signs of the disease**

- ◆ High fever (that stays 1-7 days)
- ◆ Running nose
- ◆ Cough
- ◆ Reddening and pain in the eyes
- ◆ Fine white spots on bucal mucus of the mouth
- ◆ Rash that starts from the face and spreads to other parts of the body by the 5<sup>th</sup> day of fever.

### **Prevention Methods**

Measles can only be prevented by vaccination

#### **4.3.7. Vaccines and care given to them**

##### 4.3.7.1. What are vaccines?

Vaccines are medicines used for the prevention of certain communicable diseases.

##### 4.3.7.2. From what ingredients are vaccine made?

Pharmaceutical industries produce vaccines from micro organisms or toxins released by disease organisms. Vaccines are made from the micro organisms or the toxins, which are causes of diseases, in such a way that they do not bring any harm to the host.

1. Killed micro organisms

**Example**

Whooping cough vaccine.

2. Live attenuated micro organisms

**Example**

Measles, polio, BCG and other vaccines.

3. Toxins prepared in such way that they do not have any serious negative effect on their hosts (Toxoid).

**Example**

Tetanus, diptheria vaccines

**Types of vaccine used during EPI and the diseases they prevent.**

Type of Vaccine	Nature of vaccine	Disease it prevents	Remark
BCG	Live attenuated	Tuberculosis	
Polio	Live attenuated	Polio	Given to children
Measles	Live attenuated	Measles	
DPT	killed organism and weakened toxin	<ul style="list-style-type: none"> <li>◆ Diptheria</li> <li>◆ Whooping cough</li> <li>◆ Tetanus</li> </ul>	Give to children
TT	weakened toxin	Tetanus	Give to mothers

**4.3.8. How are vaccines spoiled?**

Vaccines will be very easily spoiled and become impotent if they are not appropriately and carefully stored and transported.

Vaccines that have lost their potency cannot protect from diseases.

The following conditions can spoil/damage vaccines.

### **Temperature**

Temperature which is above 8°C spoils vaccines. Polio and measles vaccines are more and quickly spoiled by temperature above 8°C.

### **Sun light**

BCG and measles vaccine are spoiled by sun light. The BCG vaccine is more spoiled/damaged than the measles vaccine.

### **Cold temperature**

Although cold temperature is appropriate for most vaccines, temperature that is higher than the standard i.e. temperature below zero degrees centigrade can spoil DPT and TT vaccines.

### **Chemicals**

We use chemicals (disinfectants and anti spetics) to destroy unwanted micro organisms. We use also alcohols and soaps for washing and cleaning. However, we must know that all types of chemicals can damage and spoil all vaccines. All vaccines at health posts and other health facilities should be kept in refrigerators at temperatures between 0-8°C.

### **Reminder**

- ◆ All vaccines should be kept in a refrigerator at 0-8°C.
- ◆ DPT and TT vaccines should not be frozen.
- ◆ No vaccines should be kept or exposed to sunlight.
- ◆ Expired vaccines should not be used. It is important to register and dispose them.

#### **4.3.9. Vaccines**

4.3.9.1. Vaccines are made from live attenuated micro organisms.

#### **4.4. Polio Vaccine**

- ◆ The vaccine that we use to prevent polio is made from live attenuated virus. The polio vaccine is a light red or light yellow liquid brought in vials which have droppers as caps. The polio vaccine is given by mouth. The dosage is 2 drops. The polio vaccine can easily be spoiled than the others by heat. It cannot be spoiled by low (cold) temperature.

#### **Measles vaccine**

- ◆ Measles is caused by a virus. The vaccine used to prevent this disease is made from live attenuated virus. This vaccine is brought as powder, attached to the bottom of its containers. This is done because, the factory that produces it freezes and dries it. In order to use the vaccine, the dry powder has to be dissolved with the diluent attached to it. The measles vaccine solution is given to children by injection. Measles vaccine can be easily spoiled by heat.

The measles vaccine powder can stay for a long time without losing its potency if it is kept in its powder form and at an optimum temperature.

But a diluted measles vaccine, since it can be spoiled/damaged within six hours even if it is kept at cold temperature, it has to be used immediately and the remaining has to be discarded. It is mandatory to always use the diluent that comes attached to it.

#### **BCG Vaccine**

- ◆ The BCG vaccine protects from tuberculosis. It is a vaccine made from live attenuated bacteria. This vaccine is a cooled and dried powder. It is necessary to dilute the powder with the

diluent that comes attached to it. It cannot be dissolved with another diluent. The vaccine is given intradermally on the right upper arm. Since BCG vaccine is easily destroyed by sunlight, the vials of the vaccine are mostly black or brown coloured. BCG vaccine can be also affected and damaged by heat. But it is not damaged more quickly than the polio and measles vaccines. A vaccine which has not been prepared with a diluent can stay for a long time provided it is kept in a refrigerator. It cannot be spoiled since it is prepared dry. But a BCG vaccine solution can be spoiled and lose its potency in a very short time. In addition to this, since exogenous bacteria can grow on it, it should be used within six hours of preparation. If there is a left over BCG vaccine, it should be properly discarded.

#### 4.3.9.2. **Diphtheria, whooping cough and tetanus (DPT) Vaccine**

##### **DPT vaccine**

DPT vaccine contains a mixture of diphtheria toxoid, killed pertussis bacteria and tetanus toxoid. It is usually called triple vaccine.

##### **Diphtheria toxoid**

Diphtheria toxoid vaccine is from the "D" vaccine group. Since the causes of diphtheria is the toxin producing bacteria, the vaccine is diphtheria toxoid. This is an inactivated poison of diphtheria. The diphtheria toxoid vaccine can be damaged by extreme cold while the DPT vaccine is damaged by heat.

##### **Whooping cough vaccine**

The vaccine for whooping cough is the "P" part of the DPT vaccine. The disease is caused by microscopic bacteria. The vaccine for this disease is prepared from killed bacteria. The whooping cough vaccine which is the "P" part is the one that is easily damaged among the DPT vaccine group.

### **Tetanus vaccine**

- ◆ The vaccine for tetanus is the "T" part of the DPT vaccine. It is named TT and has a separate preparation. The vaccine is a toxoid and like the diphtheria toxoid, if exposed to severe cold, it can be easily damaged. TT vaccine can also be damaged by heat.

DPT and TT vaccines are vaccines prepared in the form of liquid. DPT is given to children while TT is given to mothers in an injection form; when the vials of both vaccines are put in an up right position, the liquid becomes clear and a silt is seen at the bottom of the vial. If the vial is tilted, the silt goes to the vaccine at the bottom of the vial and dissolves. The solution then becomes cloudy. When the vial is put again in an up right position, a silt is gradually formed and at the top of the silt, a clear fluid is seen. Therefore, before DPT and TT vaccines are given, it is necessary to shake and mix the two parts in the vial.

#### **4.3.10. Care that should be taken for vaccines (Cold Chain)**

Vaccines should be stored carefully, with the right temperature (0-8°C) right from the factory where they are manufactured up to the time they are given to children and mothers. The vaccine containers used to keep vaccines at the right temperature from where the vaccines are manufactured to the children and mother to be vaccinated and the people involved in transiting the vaccines with care and at the optimum temperature collectively constitute the Cold Chain. Man and cold chain equipment are parts of the cold chain. Out of these two man, becomes a major component in the cold chain system. Therefore, if men are not careful, equipment



alone cannot keep the cold chain. Hence, health extension workers have a big responsibility in managing the cold chain.

Keeping the cold chain of vaccines is very important. Because, if vaccines are not kept at the appropriate temperature, they can be easily spoiled and their potency will be lost. It is not possible to get back their potency by putting them back to the temperature required once they are destroyed. It is not also possible to prevent diseases by vaccinating children and women with such damaged vaccines. Therefore, it is always imperative to maintain the cold chain and give potent vaccines to children and women. Keeping the cold chain is a decisive issue and because of this, keeping the cold chain is the backbone bone of any vaccination programme.

Once vaccines reach to a health post, they must be stored in a refrigerator at a temperature between 0°C and 8°C.

They must be transported to vaccination centers in cold boxes or vaccine carriers packed with plastic ice packs. The ice packs must have ice before using them to transport the vaccines.

The vaccines should be kept in pieces of ice or on ice plastics when they are being given to children and mothers.

### **Different cold chain maintenance materials required for kebele vaccination extension activities.**

#### **1. Vaccine Carrier**

Vaccine carrier is a box used to transport vaccines. It has lesser size and capacity than a cold box. It is possible to keep well vaccines for 24 hours in a vaccine carrier, provided its internal four corners are adequately filled

with ice plastics. A thermometer must be kept inside it to regulate its internal temperature. At least one vaccine carrier should be present at a kebele level.

## **2. Ice Packs**

Ice packs are plastics bags for containing ice water. At least 8 ice plastic bags are required for one kebele. Before planning to use ice packs in a vaccine carrier for transporting vaccines, they have to be kept and made cold for at least two days in the cold chambers of a refrigerator. Ice packs help to keep vaccine at the right temperature in an ice box or vaccine carrier.

## **3. Thermometer**

Thermometer is an instrument for measuring heat and cold by keeping it in a refrigerator, cold box and vaccine carrier. It helps to regulate the temperature and conditions of vaccines.

### **4.3.11. Reading and using vaccine vial monitor (VVM)**

Stamping signs on the vials of vaccines that indicate the conditions (whether they have been affected by temperature or not) of the vaccines that we use for vaccination programmes have been started recently. The indicative sign is known as vaccine vial monitor (VVM). At the present moment, VVM is only stamped on polio vaccine vials. This has been done due to the fact that polio vaccine has the behavior to be easily damaged than the other vaccines.

VVM is a sign that is put at four corners, having white colour. It is circled by a material that has grey colour. Therefore, health extension workers have to ensure that polio vaccines are not damaged by temperature by seeing the VVM on the vials.

### **Methods of reading and using the VVM**

- ◆ If the four corners that are found at the middle of the grey circle are white, the vaccine can be used.
- ◆ As time goes, the white sign which was in the four corners, starts to be grey. The vaccine can be used even at this condition.
- ◆ If the white sign in the four corners of the vial is spoiled and has the same sign (turned to grey) due to temperature, the vaccine is damaged and cannot be used.
- ◆ If the four corners that have been white have turned into black, there is no way to use the vaccine. It is damaged.

Picture (VVM)

#### **4.5 Where, when and how vaccines are given?**

Children age 0-11 months and women of child bearing age (15 - 49 years) are beneficiaries of vaccination services.

#### **Provision of vaccination extension package service within a kebele health extension programme.**

Conducive conditions will be created for kebele health extension worker to get vaccines with vaccine container boxes and to provide vaccination to children and mothers from nearby health facilities on the bases of the vaccination schedule developed for kebele communities.

Since most of the vaccines are given by injection, the solution of measles and BCG vaccines are not comfortable for handling and can be easily damaged by temperature. Left over vaccines of DPT,TT and polio have to be put back in a refrigerator and have to be used at another time, provided we keep the cold chain of vaccines and maintain their efficacy. Accidents that affect the efficacy of vaccines have to be prevented. Because of problems related to cold chain and the provision of quality and effective vaccines to beneficiaries, the health extension workers are not expected to carry out house to house vaccinations

Rather, providing vaccination by health extension workers at static and out reach sites without risking the effectiveness of vaccines and the conditions which are conducive to beneficiaries is an alternative that can be considered.

### **Number and distribution of vaccination sites that could be established in a kebele**

The following factors will be considered in deciding the number and distribution of vaccination sites at kebele level.

- Settlement pattern and number of the kebele population
- Number of eligible population (children and women)
- Geography of the kebele
- Condition for the kebele people to get vaccination without any problem
- Delivering of vaccines and other materials
- Programs of other health extension activities
- Number of health extension workers
- Decision that could be made considering the needs of the beneficiary society

Static vaccination centers can be established, in the kebele health post and if there is no kebele health post, at the health extension workers office. This

vaccination center will provide service to the population living within 5 km radius. It can give service once a week or more times as conditions permit, on a permanent basis.

As known, the settlement pattern of the rural population is scattered and because of this, it is difficult to serve all kebele population in one vaccination center. Therefore, it becomes very important to establish as many additional outreach centers as possible to make vaccination accessible to everyone. To make every kebele inhabitant beneficiary of the service, at least 2-3 outreach centers have to be established in places where and when they can be convenient to the kebele people. The centers could be at schools, market places, churches, mosques and villages for providing service on the basis of an appropriate schedule. The health extension agents must involve kebele councils, inhabitants of the kebele and other concerned societal groups in deciding the number and location of the centers, and in drawing a realistic vaccination schedule. Each outreach center will be providing service once a month to people living within 5 km of radius. Rooms in the selected outreach centers shall be clean and conducive for service. They shall have entry and exit doors, seats and adequate light.

On the other hand, the health extension agents can undertake house to house polio vaccination activities during national immunization days on the basis of decisions made at the national level. Since it is only polio vaccination that is given on national immunization days and the polio vaccine is given orally, there will not be any major problem for the health extension workers to give house to house vaccinations. Health extension workers can carefully take the polio vaccine with them in ice boxes/ ice plastic bags or glass bottles in a box which has a strap for carrying it by shoulder, and give house to house vaccination to children under 5 years of age. Health extension workers have always the responsibility of seeing the monitoring signs on the vial to check the condition of the vaccine. If the monitoring sign indicates any sign of damage to the vaccine,

the health extension workers must immediately count, register and carefully dispose the vaccine. They have to also report the situation to the next authority.

As described above, there are problems in undertaking the regular house to house vaccination. The problems are the following

- Since most of the vaccines are given by injection, it is difficult to go house to house and administer these vaccines
- BCG and measles vaccines are given after they are diluted with their diluents. Liquid vaccines are easily damaged and spoiled by heat. On top of this, the BCG vaccine, once it is prepared as solution, it is difficult to take them from house to house.
- Based on the objective condition of the kebele health extension, as related to maintaining the cold chain, it is difficult to have all the necessary vaccines and do house to house vaccination. This condition can challenge the efficacy of the vaccines and will pose dangers to the whole vaccination process.
- In general, it is not ideal or appropriate to run the regular house to house vaccination service by health extension workers keeping its potency, although it is possible to find every eligible child and women and to give the service.

If in the future, vaccine storage and defreezing services are made available, the settlement pattern of farmers is changed, transport and road services are improved, house to house vaccination can be made possible.

The regular house to house vaccination service can be provided by the health extension workers if the following can be met.

- When vaccine can be carefully transported by hand bags or by a box that has a strap to carry it by the shoulder
- Adequate AD syringes for diluting the vaccine
- Adequate registration book and cards

- Tally sheet for registering daily work
- IEC materials in adequate number
- Adequate transport facility

The health extension workers can use the specific steps of activities set for each vaccine when they undertake house to house vaccination.

In order to make the vaccines bring the desired result, the health extension workers have to take into account the age of beneficiaries, dose of vaccine, number of vaccinations given to a beneficiary, part of body that vaccines are given etc. The health extension workers are expected to give vaccines on the basis of the following steps.

### **Picture about giving vaccine by injection**

In order to fully implement the specific activities of a vaccination programme, the following activities have to be undertaken step by step

Making division of labor

1. The health extension workers for the days work (who, what...)
2. Preparing the waiting place comfortable for beneficiaries
3. Preparing the vaccination room to make it comfortable for vaccination work
  - Clean the room
  - Prepare adequate sitting chairs
  - If available, prepare a table for putting vaccines

If chairs and tables are not available, local materials can be used

4. Deciding how the beneficiaries can be served once they enter into the vaccination room (which way they enter and which way they exit)
5. Materials required for the programme are
  - Vaccination book
  - Vaccination cards
    - children's vaccination cards
    - mothers' vaccination cards
    - Tally sheets
6. IEC materials (posters, flip charts)
7. Materials required for the days vaccination work and which should be put in the vaccination room
  - Vaccine carrier and cold ice packs
  - Vaccination needles and syringes
    - Syringes for giving BCG vaccine AD syringe 0.05/0.1 cc
    - Syringes and needles for giving DPT, measles and TT vaccines 0.5 cc
    - Syringes for diluting measles vaccine 5 cc
    - Syringes for diluting BCG vaccine 2cc
  - Safety boxes (for collecting and disposing used needles and syringes)
  - File for cutting ampules
  - Cotton
8. Taking out vaccines required for the days work from vaccine carriers and putting them in vaccination room. When vaccines are taken out from the refrigerator, the principle of "those that entered first will be used first (FIFO)" shall be applied.
9. Preparing and putting cold ice packs in the vaccination room to keep vaccines cold on a table during vaccination.
10. Making vaccination attendants sit in the waiting place on the basis of their coming.



11. Register new comers, give them cards, separate the repeaters and those who will be taking full vaccination, the date of vaccination in the registration book and respective individual cards.
12. Filling the day's vaccination on the tally sheet.
13. Giving common health education with well prepared IEC materials (give education that is brief and that involves mothers)
14. Preparing the vaccines to be given to beneficiaries on the basis of the information got during the days registration
15. Preparing cold ice packs which will be used for putting vaccines on the table that is placed in the vaccination room.
  - Based on the number of registered beneficiaries, taking out the amount of vaccines that is required for the day's work from the vaccine carrier and placing them on the ice packs
  - Preparing a safety box (carton box) for collecting used needles and syringes
  - Preparing cotton
  - Putting polio vaccine dropper on vaccine vial
  - Preparing in a proper way, vaccines that are to be given by injection (BCG and measles)
  - Disposing used needles and syringes into the collection carton box.
16. Starting to receive beneficiaries by taking them into the vaccination room on the basis of their turn. It is not appropriate to take many mothers at one time into the vaccination room. Let few mothers get into the room
17. Receiving with humble and thanks those that come for vaccination and making them sit. Giving short and clear advise on the following
  - For what diseases vaccines are given
  - How many times and for how long vaccines are given
  - What sort of minor illnesses they will have after vaccination and what parents have to do when the illnesses occur
  - The impact of not being vaccinated at the appropriate age and the impact of dropping out

- On which part of the body the vaccines are given
  - Carefully informing mothers on how they should handle children during vaccination
  - Sitting the beneficiaries comfortable and stabilizing them
18. Receiving vaccination cards from the beneficiaries and checking carefully the vaccines that are going to be given to the beneficiaries.
  19. If they have polio vaccine to take, giving the polio vaccine before the other vaccines
  20. Giving carefully the injectable vaccines with the appropriate dose, syringe and needles
    - Prepare BCG vaccine with 0.05/0.1 cc AD syringes and needles
    - Prepare measles vaccine with 0.5 cc AD syringes and needles
    - Prepare TT vaccine with 0.5 cc AD syringes and needles
  21. Carefully separating and giving vaccination cards to children and mother on the basis of the following line of order.
    - 21.2 Polio vaccination.
    - 21.3 BCG vaccination wash and clean that part of the body where vaccination is to be given with water and cotton, if necessary.
    - 21.4 Measles vaccine wash and clean that part of the body where vaccination is to be given with water and cotton, if necessary.
    - 21.5 TT vaccination.
  22. Disposing carefully syringes and needles with no recap of used needles in a collection carton box, safety box after each vaccine is given.
  23. Giving clarifications on next appointment date, handling of vaccination cards, and the risk of interrupting vaccination. A vote of thanks shall be given.
  24. Deciding on left over vaccines. Decision should be given on the basis of the rule. They have to be either returned to the refrigerator or have to be thrown. This means the vials that contain left over polio, DPT and TT vaccine can be used at the next session. But since left over BCG and

measles vaccine cannot be used after six hours, they have to be properly disposed.

- 25 Used needles and syringes should be thrown into the carton box. If the box is full, they have to be burned in a pit prepared for this purpose. Those materials which cannot be burned should be carefully buried. Used syringes and needles shall not be scattered and thrown, since they can bring harm to the surrounding community.
- 26 Cleaning the room, materials and surroundings areas after the end of the day's vaccination activity.

**Reminder:-**

Appropriate care shall be taken not to contaminate syringes and needles which will be used for future vaccinations and the vials that contain vaccines.

Hereunder, are activities that will be implemented to carefully and appropriately give each vaccine

**1. Polio vaccine**

- Polio vaccine is given to prevent childhood poliomyelitis
- Polio vaccine is to be given for children

**1.1 Age at which it is given**

**Children**

- Polio zero as soon as they are born
- Polio 1 - at 6 weeks of age
- Polio 2 - at 10 weeks of age
- Polio 3 - at 14 weeks of age

Therefore, in the process of polio vaccination, the interval between the 1<sup>st</sup> and 2<sup>nd</sup> rounds and between the 2<sup>nd</sup> and 3<sup>rd</sup> rounds of vaccination will be one month or 4 weeks.

**Dose**

Polio vaccine is given in the form of drops and by mouth. The dose is only two drops at one time.

### **Side effects**

Children will not show any different signs after taking the polio vaccine. However, if a child has diarrhea at the time he is taking the vaccine; the causes of the diarrhea can possibly affect the effectiveness of the polio vaccine. Therefore, it would be useful if the child is given one additional polio vaccine at one month interval after he finished his vaccination.

### **The delivery of polio vaccine on the basis of line of order**

- 1.2 Identify, and register all children that came for polio vaccination. Give the necessary health education
- 1.3 Tally given polio vaccine on a tally sheet.
- 1.4 Take the mothers in the vaccination room and make them sit. Get their vaccination cards and identify the vaccination they are going to take.
- 1.5 Take out from the vaccine carrier vaccines required for the day and put them on the ice packs prepared on the table. Fit a dropper on the polio vaccine vial.
- 1.6 Educate and give the necessary advice to the mother on how she can properly and comfortably handle the child for the vaccination.
- 1.7 Carefully give two drops of polio vaccine by properly opening the mouth of the child. Ensure that the child has swallowed the vaccine. If he vomits the vaccine, it is necessary to give him again.
- 1.8 Register the next appointment date on the vaccination card and inform the mother about it. Tell the changes that may occur after vaccination and the action which she should take for what happens. Give the card and thank the mother. If the child has another vaccination, he should be given properly and with care.
- 1.9 If there is left over vaccine, see the indicative sign and if not spoiled, it should be carefully but back in the refrigerator since it will serve in the next vaccination session.

## Picture on how polio vaccine is given

### 2. Process of BCG vaccination on the basis of line of order

- BCG vaccination is given to prevent tuberculosis. BCG vaccine is brought in the form of powder
- BCG vaccine is given to children immediately after birth

#### Dose

0.05 cc - <1 year of age

0.1 cc - > 1 year of age

- Part of body that the vaccine is administered is the right arm
- Method of administration

**Intradermal:-** If the vaccine is properly given, a minor swelling that looks like an orange will be clearly seen. Mothers should be advised not to massage it.

### **Side effects**

Children will have a 10 mm wide red and soft swelling on the site of vaccination around the second week of vaccination. This swelling will later change into an ulcerous swelling. Finally, the ulcer will heal and leave behind a 5mm scar. This shows that the vaccine has worked well. Therefore, it is mandatory to advise mothers not to panic with the situation and not to do any thing to cope up with the situation.

But,

- If errors are made during the preparation of the BCG vaccine,
- If syringes and needles are not cleanly used,
- If the vaccine is not given in a proper way and given intramuscular rather than intradermal,
- If the vaccine is given more than the appropriate dose,

The vaccine can develop a big swelling on the site of vaccination which is not a characteristic of the vaccine. Therefore, BCG vaccination has to be given carefully and in a proper manner. When children with such a problem are encountered, the mothers should be psychologically stabilized and referred to the next health facility (health center). A follow up should be made to know the condition.

### **Administration of BCG vaccination**

- 2.1. Identify the children that came to take BCG vaccine on that day.
- 2.2. Register the children in the registration book and registration card. Give the necessary health education.
- 2.3. Tally the vaccine that is going to be given on a tally sheet.
- 2.4. Prepare syringes and needles for vaccination and dilution of vaccine - 0.05/0.1 syringes and needle for giving the vaccine and 2ml syringe for diluting the vaccine.

- 2.5. Take a few of the mothers into the injection room and make them sit keeping their order. Take their card and identify the type of vaccine that will be given.
- 2.6. Ensure that one vial of BCG vaccine and 1cc vial of diluents are taken out from the vaccine carrier for the day's activity.
- 2.7. Take out the diluents with a 2cc syringe and needle and dilute the vaccine. Dispose immediately the syringe and needle used for diluting the vaccine into the waste collection carton box or safety box (one disposable syringe should be used for one vial of diluents)
- 2.8. Put the diluted BCG vaccine on the prepared ice pack located on the BCG vaccination table.
- 2.9. Ask the mother on the line of order to prepare the hand of the child, and to hold the child properly. Give the necessary advice to the mother.
- 2.10. Fit the 0.05/0.1cc syringe to its needle and take out from the vial 0.5 cc vaccine
- 2.11. If found necessary, clean with cotton the site (child's right arm) where the vaccine is going to be given.
- 2.12. Give the vaccine intradermally
- 2.13. Dispose the used syringe and needle with no capping into the waste carton box (safety box)
- 2.14. Mark the next appointment on the card and inform well the mother the next appointment date and about the swelling and ulcer that occur on the site of vaccination, and what she has to do when these occur. Give the card, thank and send her back home.
- 2.15. Dispose properly the left over vaccine after six hours.

### **Contra indications**

BCG vaccination will not be given if signs of AIDS are seen in the child.

### **Picture on how BCG vaccination is given**

#### **3. DPT vaccination**

- DPT vaccine is prepared in one bottle for the prevention of diphtheria, whooping cough and tetanus.

#### **Age at which the vaccine is given**

- DPT<sub>1</sub> - at 6 weeks of age.
- DPT<sub>2</sub> - at 10 weeks of age.
- DPT<sub>3</sub> - at 14 weeks of age.

There will be 4 weeks interval between the first and second, and between the second and third rounds of DPT vaccination.

#### **Dose**

0.5 cc

#### **Part of the body vaccine is administered**

On the lap of the child anteriolateral aspect of thigh.

#### **Method of administration**

Deep intramuscular

#### **Side effects**

- Irritability/ lethargy and fever on the evening the vaccine is given. Nevertheless, the fever has to subside within one day.



- It is preferred if the child is examined for the fever that occurred 24 hours after vaccination since it is not related to the DPT vaccination.
- It is possible that some children can have redness, swelling and pain on the site of injection. Mothers should be given proper advice on these situations.
- If the child develops pain and swelling on the site of vaccination after one week of vaccination, it means that there is poisonous effect and a swelling that has pus will develop. These occur when the DPT vaccine is given with unclean syringes and needles and not in an appropriate method (intramuscular). Therefore, it is necessary to take the necessary care while giving DPT vaccination. If such types of cases are encountered, the health extension workers have to refer the children to the next health facility (health center), make a follow up of the situation and combat through education, the counter agitation that comes as a result of this situation.

### **Administration of DPT vaccine**

- 3.1 Identify the children that came for DPT vaccination (new and repeat)
- 3.2 Register the children in the registration book and registration cards. Give the necessary health education to mothers.
- 3.3 Tally the vaccine that is going to be given on a tally sheet.
- 3.4 Take into the vaccination rooms only those who came for the DPT vaccination. Check if there are children who are brought for DPT vaccination from those who have earlier entered into the vaccination room or take children to be vaccinated into the vaccination room and make them sit on their line of order. Get their cards and identify the type of vaccine they will be taking.
- 3.5 Ensure that one vial of DPT vaccine is taken out from the vaccine carrier and put on ice packs, displayed on the vaccination table. Check if the vaccine is not frozen.

- 3.6 Show and advise the mother how she can prepare the lap of the child for vaccination and how she can hold him.
- 3.7 Take the vial from the ice pack on the table and shake the vaccine to ensure that it has dissolved with the diluent.
- 3.8 Wash hands well with soap and water and take out 0.5 cc DPT vaccine by 0.5 cc AD syringe and needle.
- 3.9 If found necessary, clean the lap of the child with cotton and give the vaccine intramuscularly.
- 3.10 Dispose the used AD syringes and needles (uncapped) into the waste carton box.
- 3.11 Fill the next appointment date on the card and inform well the mother about the side effects of the vaccine and what she has to do when side effects occur. Give card, thank and send the mother back home.
- 3.12 Put back left over DPT vaccine vials into the refrigerator so as to use them in the next vaccination sessions. Use these vaccines before any other vaccines on the next vaccination session.

### **Contra indications**

- If the child shows shivering after taking the vaccination, he shall not take DPT vaccine for the second time. If the child comes back, DT or TT can be given to him instead of DPT for the remaining vaccine period. The dose of DT and TT vaccine is 0.5 cc.

**Picture on how to give DPT vaccination**

#### **4. Measles vaccination**

- Measles vaccine is given to prevent measles disease. It is prepared in the form of powder.
- Measles vaccine is given at the age of 9 months
- It is given on the right arm
- It is given subcutaneously

#### **Side effects**

- Fever and rashes which stay for 1-3 days occur after one week of taking the vaccine. Advice on this should be given to mothers.

#### **Administration of measles vaccination**

- 4.1 Identify the number of children that came for measles vaccination and register them in registration book and card. Give the necessary health education.
- 4.2 Ensure that there are other children that have been brought for measles vaccination from those that have already went into the vaccination room. Or take in into the vaccination room other children from the line, take their cards and identify the vaccination that they will be taking.
- 4.3 Prepare disposable AD 0.5 cc syringes and needles for vaccination and AD 5 cc syringes and needles for preparing the measles vaccine solution.
- 4.4 After washing hands with soap and water take out one vial of measles vaccine and one vial of diluent (5 cc) from the vaccination storage box and put them on the ice pack which is displayed on the vaccination table. Fit the 5cc disposable syringe with its needle and take out the diluent from the vial and mix it with the vaccine. Immediately dispose the used syringe and needle (uncapped) into

- the waste carton box. (one diluent syringe and needle should serve for one time)
- 4.5 Put the mixed vaccine on the prepared ice packs which are displayed on the table.
  - 4.6 Show to the mother how she can prepare the left arm of her child for vaccination.
  - 4.7 Take out 0.5cc vaccine from the vaccine vial with 0.5cc AD syringe and needle.
  - 4.8 Clean with cotton the site of vaccination on the left arm when necessary.
  - 4.9 Give 0.5 cc vaccine subcutaneously to the child
  - 4.10 Immediately dispose the used syringes and needles (uncapped) into the waste carton box.
  - 4.11 Inform the mother about the remaining vaccination, if he has, the appointment date, the side effects of the vaccine and how the mother should keep the card. Give the card, thank properly and send her back home.
  - 4.12 Dispose properly any left over measles vaccine after six hours.
  - 4.13 Properly clean the vaccination room and the materials used. If the waste carton box is full burn or carefully burry all waste materials after end of the day's vaccination activities.
  - 4.14 Properly put the registration book and tally sheets.

**Picture that shows the administration of measles vaccine**

### Contra indications

- There are no contra indications for giving the measles vaccine. Nevertheless, no BCG vaccine will be given to a child who has the signs of AIDS.
- If a child shows a sign of shivering after taking DPT vaccine, he should not take DPT vaccine again
- A mother who is not willing to vaccinate her sick child should not be forced for vaccination. But, it is necessary to educate and convince her on the importance of the vaccination.
- Therefore, since there are no contra indications apart from the above to the measles vaccine, children who are even sick, have fever, and malnourished can be vaccinated.

### Administration of vaccines

Sr. No	Type of vaccine	Age vaccine is given	Site of vaccination	Method of administration	Dose	Remarks	
1	BCG	As soon as the child is born/ before 1 year	Right arm	intradermal	0.05cc	--	
		> 1 year	Right arm		0.1cc	--	
2	Polio	0	As soon as child is born	Oral	Oral	2 drops	There shall be 4 weeks intervals between polio 1, 2 and 3
	Polio	1	At 6 weeks	Oral	Oral	2 drops	
	Polio	2	At 10 weeks	Oral	Oral	2 drops	
	Polio	3	At 14 weeks	Oral	Oral	2 drops	
3	DPT	1	At 6 weeks	Thigh	Intramuscular	0.5 cc	There shall be 4 week intervals between DPT 1, 2 &3
		2	At 10 weeks	Thigh	Intramuscular	0.5 cc	
		3	At 14 weeks	Thigh	Intramuscular	0.5 cc	
4	Measles		At 9 months	Left arm	Subcutaneous	0.5 cc	--

### Vaccination Schedule

Sr. no.	Age of vaccination	Type of vaccine given
1	At birth	BCG, Polio 0
2	At 6 weeks	DPT <sub>1</sub> , Polio 1
3	At 10 weeks	DPT <sub>2</sub> , Polio 2
4	At 14 weeks	DPT <sub>3</sub> , Polio 3
5	At 9 months	Measles

#### 5. TT Vaccination

- TT vaccination is given to prevent tetanus from mothers and children. It is supplied in a vial in the form of a liquid. It is repeatedly (5 times) given to women of child bearing age (15-49 years) on the arm. This is a vaccine that can be given to pregnant and non-pregnant women.

#### Vaccination schedule

- The first round of TT vaccine - when women of 15-49 years of age comes to a health post or vaccination center.
- The second round of TT - after 1 month (4 weeks) of first round of vaccination.
- The third round of TT - 6 months after second round of vaccination.
- The fourth round of TT - 1 year after third round of vaccination.
- The fifth round of TT - 3 year after third round of vaccination.

Those women who have taken the six rounds of TT vaccine can be prevented from tetanus throughout their life.

- Dose of vaccine - 0.5 cc
- Site of vaccination - left arm
- Method of administration - intramuscular

There are no major signs of side effects on the body after taking TT vaccine. Nevertheless, there will be slight pain, swelling and reddening at the site of vaccination. These signs will disappear within few days. It is necessary to inform mothers about these signs and symptoms.

### **Administration of TT vaccination**

- 5.1 Identify the number of new and repeating mothers that will be vaccinated on the day
- 5.2 Register those mothers that will be vaccinated in vaccination book and cards. Give the necessary health education.
- 5.3 Tally the TT vaccine that will be given.
- 5.4 Identify those mothers that will take TT vaccine from those that have earlier entered into the vaccination room and bring in other mothers in line of order into the room. Receive their cards and fill well the vaccine that they would be taking.
- 5.5 Prepare 0.5cc AD syringes for giving the TT vaccine
- 5.6 Take out in advance, from the vaccine carrier, TT vaccines and put them on ice pack. Ensure that it is not frozen.
- 5.7 Inform the mothers to prepare their left arms.
- 5.8 Pick a TT vaccines vial from the ice packs on the table, shake and mix well the vaccine
- 5.9 Fit in carefully the needle to the 0.5 cc AD syringe, take out 0.5 cc vaccine from the vial, and inject intradermally into the left arm of the mother.
- 5.10 Dispose carefully used syringes and needles (uncapped) into the waste carton box
- 5.11 Enter the next appointment date in the card, inform well the mother about the possible side effects and the necessary actions she can take with regard to the side effects. Give the card, thank and send her back.

5.12 Return back into the refrigerator the left over TT vaccine vial since it can be used in the next vaccination session.

Picture on TT vaccine administration

**Administration of TT vaccine**

<b>Sr. no</b>	<b>Vaccine</b>	<b>Time of vaccination</b>	<b>Site of vaccination</b>	<b>Method of vaccine administration</b>	<b>Dosage of vaccine</b>	<b>Protection period</b>
1	TT <sub>1</sub>	Women 15-49 years	Left arm	Intramuscular	0.5cc	No
2	TT <sub>2</sub>	1 month (4 weeks) after first vaccination	Left arm	Intramuscular	0.5cc	3 Years
3	TT <sub>3</sub>	6 months after second round vaccination	Left arm	Intramuscular	0.5cc	5 Years
4	TT <sub>4</sub>	1 month after third round of vaccination	Left arm	Intramuscular	0.5cc	10 Years
5	TT <sub>5</sub>	1 year after fourth round vaccination	Left arm	intramuscular	0.5cc	Life time



## **Reminder**

- Any syringe and needle used for mixing and administering vaccines should be disposed in such a way that they do not affect the health of children, mothers, health workers and the surrounding community.
- Children and mothers may not come for vaccination at their appropriate age. When such situations occur, there is no reason to deny the vaccination they are looking for. Therefore, health extension workers should very well educate children and mothers, the importance of coming for vaccination at the appropriate age.
- On the other hand, children and mothers who come late should be given vaccination. This means that a child who is brought at the age of 6 months to start his/her vaccination should not be sent back without giving him/her the necessary vaccination since the parents may have different reasons for the delay. There is no other better alternative apart from giving his vaccination.
- Care should be taken by health extension workers on repeatedly given vaccines, which are
  - Polio and DPT vaccines for children
  - TT vaccines for mothers

Children and mothers may not sometimes come back for repeated vaccination on their appointment date. They can stay long beyond their appointment date.

## **For example**

- A child when given an appointment of 1 month or 4 weeks for the second or third round of the polio and DPT vaccination could come after 2 or more months.
- A mother when given a 6 months appointment for the third round of TT vaccination could come after a year.

What should the health extension workers do when such situations occur?

- When children and mothers interrupt their vaccination and when they come delayed and beyond their given appointment date, it is not necessary and important to take them as new starters. They shall not be sent back with out vaccination.
- With regard to defaulting, since there is no maximum interval that has been decided; children and mothers should be given the vaccination keeping in mind the number of vaccinations they have taken in the past.

However, this does not mean that there is no problem with defaulting or interrupting the vaccination. Health extension workers should exert maximum effort on mothers to complete the necessary vaccinations to prevent the vaccine preventable diseases and to complete their vaccination at the expected date of completion so that the intended purpose of the vaccination programme is met.

## **5. Expected outcomes of the vaccination package**

1. The society will know the advantage/ value of vaccination service.
2. Families, children and mothers will be beneficiaries of the vaccination service.
3. The number of defaulting children and mothers will be reduced.
4. Illnesses, disabilities and deaths of children and mothers which occur due to vaccine preventable diseases will be reduced.
5. By providing extended vaccination to children and mothers, the financial resource used for the purchase of drugs will be reduced.
6. Since children are citizens of tomorrow, the national effort to generate a healthy and responsible generation will succeed.
7. The time and financial resource wasted by each family to address health problems that emanated from vaccine preventable disease will be reduced
8. Will contribute to the national effort of eradicating polio from Ethiopia.

9. Will assist the integration of new vaccines into the expanded program of immunization.

## **6. Methods of communication for vaccination service**

### **1. Traditional methods of communication**

Preparing and staging musics, songs, poems and others, with youths and other talented people for people that cannot read, write and other groups of societies to raise their awareness, recreate them and generate discussions on the importance of vaccination services. The implementation of this method should involve communities.

### **2. Method of communication during health and social related holidays**

Preparing and communicating through appropriate methods, messages that have value to vaccination services on popular cultural, religious and public holidays at public gathering places.

### **3. Use of prominent and heard people**

Respected, known and heard people from the kebele must first be identified and be made to know about the value of vaccination. Through these people, families and communities shall be educated and enable children and mothers be beneficiaries of vaccination services.

### **4. Method of role playing**

Some mothers, youths and other community members should be selected to play some roles representing behaviors which are based on objective conditions. Example: playing the role of polio children, role of unvaccinated children i.e showing and discussing the suffering and death of unvaccinated children.

**5. Communication through dramas**

Messages can be communicated to the society through dramas by involving young students and teachers, young farmers and other talented social groups. The messages on the advantage of vaccination should be communicated through dramas. However, the dramas must be appropriately prepared and staged as means of educating and passing important messages to a large audience on vaccination. The preparation of dramas should be based on and focus on local traditional practices.

**6. Communication through reading materials**

Reading materials which focus on vaccination are effective methods of communication i.e posters, leaflets... etc can be used.

**7. Communication through demonstration**

Since vaccination can be given at static and outreach sites, demonstrations can be organized at these sites for known individual, youths, women, farmers, development workers on the effectiveness and life long protection of vaccines. This is to raise the awareness of these people and to reach communities through these people.

In addition to the above, demonstration can be prepared to show vaccination coverages and the problems with vaccine preventable disease before and after the vaccination service package. The above social groups should be able to demonstrate to their communities what they have seen and understood with regard to the importance of the package.

**8. One to one method of communication**

This method is used by the health extension workers during their house to house visit, and applied during visits to villages, kebeles and other places.

This is a method that provides immediate feed backs on issues discussed and questions raised. It also gives an opportunity to exchange ideas, and to take joint actions. The one to one method of communication can also help to bring changes on knowledge, attitude and practice and to bring about healthy conditions. This is a powerful method which promotes open participation. Therefore, health extension workers have to use this method to educate at family level, register and persuade new beneficiaries and defaulters.

## **7. Collection of information, monitoring and evaluation**

Monitoring and evaluating the implementation of the package is an activity that would be undertaken by federal regional woreda institutions, kebele council and the health extension workers. This is an important effort that contributes to the sustainability and success of the package. Based on this, the following activities will be undertaken

### **7.1 Health extension workers will**

- Register and document baseline information
- Register and document the number of people in kebele by sex, age and occupation.
- Register and document schools, government and non-government organizations, farmer, youth and women associations
- Register new beneficiaries and defaulters
- Collect any information related to vaccine preventable diseases
- Prepare plan of action related to the kebele vaccination service extension package.
- Develop the necessary tool for follow up and registration of their daily activities and perform their activities accordingly.
- Monitor the implementation of the package by drawing a program, and conducting weekly home visits, organizing individual and group discussions with those coming for health education. Assist

communities in overcoming problems by providing professional and technical assistance.

- Compile activities that have been undertaken during the day. They shall prepare and submit to the woreda health office and kebele council monthly, quarterly and annual reports on achievements and progress of the package and problems encountered during the implementation of the package.
- Monitor the immunization coverage level by using the immunization coverage monitoring chart.
- Inform the kebele people and kebele council the days when vaccination will be given to the kebele people.
- Conduct monthly monitoring meetings with the kebele council and other concerned bodies on the vaccination service extension package. Effort will be made by them to find solution for the problems encountered.

## **7.2 Kebele councils**

- Documents information which are required for vaccination service extension activities and which can be available at kebele level
- Monitors and ensures that the vaccination service extension package is delivered on time and sufficiently to the kebele people. Provides necessary assistance to the implementation of the package.
- Coordinates the kebele communities for the successful implementation of the vaccination service extension package.
- Evaluates the progress of the package on a monthly basis with kebele health extension workers. Take actions against problem encountered, as necessary.

### **7.3 Woreda health office**

- Develops on time plans related with the health and vaccination service extension package.
- Documents the necessary information related to vaccines and supplies needed for the vaccination service
- Monitors the implementation of the woreda vaccination service extension package activities and ensure that they are on the right track and are delivering the expected results by preparing and using checklists. Evaluates the performance and problems of the health extension workers, seek solutions to the problems encountered. Provide close professional assistance; conduct monitoring and evaluation meetings once in three months or as necessary with the kebele council.
- Provides training or orientation to health extension workers when new and innovative ideas related to vaccination are introduced.
- Exchange experiences with neighboring kebeles and woredas.
- Conduct woreda level meetings twice a year with health extension workers to know the status of vaccination activities.
- Compile and submit to the regional health bureau monthly, quarterly and annual reports received from health extension workers. By analyzing the information, makes a follow up on woreda and kebele level vaccination service activities. Use the information for strengthening activities.
- Provide necessary and timely support for activities related to inventory and need assessment at the health post level.

### **7.4. Regional Health Bureau and Federal Ministry of Health (FMO)**

- Prepare a standard national reporting and monitoring form related to the package.

- Conduct an inventory on vaccination service materials, and supplies and document the necessary information by type and quantity.
- Compile the quarterly reports from the woredas and send them to FMOH.
- Evaluate the implementation of region specific packages which have been improved on the basis of specific regional conditions in collaboration with government and non-government organizations, kebele councils and beneficiaries of the package. Evaluation meetings will be conducted twice a year at regional level and once a year at federal level.
- Develop appropriate strategies that will help better implementation of the package by analyzing and studying the achievements, and advantages of the package, the problems and constraints encountered during implementing of the package.
- Prepare and share to regions a report that contains observations, and recommendations for improving implementations, solution to problems encountered and other comments. Similarly, through the coordination of regional health bureaus, evaluations will be undertaken and a report that contains recommendations that help to improve implementations, actions taken to overcome problems and other suggestions will be prepared and sent to the FMOH and woreda health offices.
- A workshop will be organized once a year by the FMOH which involves all regions that implement the package to evaluate the package and exchange experiences. The report that contains the joint recommendations and a work plan for the coming will be sent out to regional health bureaus and woreda offices for future actions.
- Activities that strengthen or improve the package will be undertaken. The activities will be identified by analyzing the



information collected through the use of questionnaires or data collection forms. This will be done as necessary.

- The regional health bureau will document information related to the skills and capacity of the health extension workers and of other professionals that are involved in monitoring the implementation of the health extension package.

## **8. Problems that will be encountered during the implementation of the vaccination service extension package and solutions to overcome the problems.**

1. Problems that will be encountered during baseline surveys
  - Lack of different materials and transport service for data collection.
  - Lack of cooperation from potential partners during the process of data collection.
  - Problems related to getting accurate information on the size of kebele population.
2. Problems with regard to the provision of health education for vaccination service extension
  - Coordination and involvement of communities and other social groups in the implementation of the planned health education program.
  - Shortage of IEC materials (posters and the like)
  - Failure to comprehend and apply the knowledge and behavioral changes achieved in favor of the package.
3. Problems of materials required for vaccination activities
  - Shortage of vaccines
  - Shortage of cold chain equipment (refrigerator, cold box, vaccine carrier, thermometer, ice packs)
  - Shortage of vaccination syringes and needles

- Shortage of vaccination registration books, cards and tally sheets.
  - Shortage of operating budget.
  - Failure of power.
4. With regard to the conduct of quality vaccination activities
    - Lack of adequate training of health extension workers for vaccination activities
    - Problems with keeping the cold chain
  5. Problems related with collaboration
    - Lack of cooperation/ collaboration from relevant partners.
  6. Monitoring and evaluation
    - Failure to undertake timely monitoring and evaluation activities
    - Failure to take necessary actions against problems encountered.
    - Lack of adequate support and assistance from concerned health workers for the vaccination service extension package.
  7. Lack of adequate follow up of children and mothers for the start and completion of their vaccination.

## **9. Solutions to overcome the problems related to the vaccination service package.**

- 9.1 Proper attention should be given by all levels of government institution to the collection and use of information related to the vaccination service extension package. The necessary materials and transport service should be met on time and in sufficient amount.
- 9.2 The kebele council should discharge its responsibility of mobilizing and coordinating the inhabitants of the kebele and others for the success of the health education activities planned by the health extension workers.
- 9.3 IEC materials which include posters, leaflets etc shall be as much as possible, provided on time by the woreda health office.

- 9.4 Health extension workers should provide adequate, quality and objective health education related to the vaccination service extension package. This should also evaluate the impact of the health education in terms of behavioral change and take necessary actions based on their findings.
- 9.5 The woreda health office and other higher bodies should fulfill requirements for the implementation of the vaccination service extension package.
- 9.6 Adequate training should be given to the health extension workers so as to enable them provide quality vaccination service extension package.
- 9.7 The kebele vaccination service extension activity shall be based on the principle of integrated and collective action and shall be put on solid foundation, appropriate actions related to this shall be taken by all concerned.
- 9.8 Timely monitoring and evaluation to strengthen the implementation of the kebele vaccination service package shall be undertaken in a sustained way by the woreda health office.
- 9.9 The health extension workers by coordinating the kebele people, shall undertake house to house search and registration of children and women so as to enable them take their vaccinations on time.

## **References for the Preparation of the Manual**

1. Vaccination and its implementation, 1-8 learning volume

Prepared by:-

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2. Vaccination and its implementation teaching volumes

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World Health Organization